



DEFENSE INFORMATION SYSTEMS AGENCY
JOINT INTEROPERABILITY TEST COMMAND
P.O. BOX 12798
FORT HUACHUCA, ARIZONA 85670-2798

IN REPLY
REFER TO: Networks and Transport Division (JTE)

30 January 2006

MEMORANDUM FOR DISTRIBUTION

SUBJECT: Special Interoperability Test Certification of Redcom Laboratories Inc. Slice™ Digital Switching System with Software Version 1.0A R1P3, Build 23 August 2005

References: (a) DOD Directive 4630.5, "Interoperability and Supportability of Information Technology (IT) and National Security Systems (NSS)," 5 May 2004
(b) CJCSI 6212.01C, "Interoperability and Supportability of Information Technology and National Security Systems," 20 November 2003

1. References (a) and (b) establish the Defense Information Systems Agency (DISA), Joint Interoperability Test Command (JITC), as the responsible organization for interoperability test certification. Additional references are provided in enclosure 1.

2. The REDCOM Laboratories Inc. Slice™ with Software Version 1.0A R1P3, hereinafter referred to as the system under test (SUT), meets all of its critical interoperability requirements and is certified for joint use within the Defense Switched Network (DSN) for the following switch types: Private Branch Exchange (PBX) 1 and PBX 2. The identified test discrepancies shown in the Certification Testing Summary (enclosure 2), which remained open after software patches were applied and regression testing was completed, have an overall minor operational impact. The SUT offers Voice over Internet Protocol (VoIP), however, this function was not tested and is not covered under this certification. This certification expires upon changes that could affect interoperability, but no later than three years from the date of this memorandum.

3. This finding is based on interoperability testing conducted by JITC. Testing was conducted at JITC's Global Information Grid Network Test Facility at Fort Huachuca, Arizona, from 9 May through 21 June 2005. Review of vendor's Letters of Compliance (LoC) was completed on 15 August 2005. Information Assurance (IA) testing was conducted on the SUT during the period of 23 through 26 August 2005. During this period, software Build 23 August 2005 was applied to the SUT to fix outstanding IA findings. JITC's evaluation determined that this new build did not have an impact on interoperability. Enclosure 2 documents the test results and describes the tested network and system configurations. System interoperability should be verified before deployment in an operational environment that varies significantly from the test environment.

4. The interoperability test summary of the SUT is indicated in table 1. The PBX 1 required and conditional Capability Requirements (CRs) and Feature Requirements (FRs) are listed in table 2. If a switch satisfies PBX 1 criteria, it will satisfy the lesser standards of a PBX 2. This interoperability test status is based on the PBX 1's ability to meet:

- a. DSN services for Network and Applications specified in reference (c).
- b. PBX 1 interface and signaling requirements for trunks/lines specified in reference (d) verified through JITC testing and/or vendor submission of LoC.
- c. PBX 1 FRs/CRs specified in reference (d) verified through JITC testing and/or vendor submission of LoC.
- d. The overall system interoperability performance derived from test procedures listed in reference (e).

Table 1. SUT Interoperability Test Summary

DSN Trunk Interfaces			
Interface & Signaling	Critical	Status	Remarks
T1 CAS (DTMF, MFR1, DP)	No	Certified	Met all CRs and FRs.
E1 CAS (DTMF, MFR1, DP)	No (Europe only)	Certified	Met all CRs and FRs.
T1 ISDN PRI NI 1/2 (ANSI T1.619a)	Yes	Certified	Met all CRs and FRs.
E1 ISDN PRI (ITU-T Q.955.3)	No (Europe only)	Certified	Met all CRs and FRs.
DSN Line Interfaces			
Interface & Signaling	Critical	Status	Remarks
2-Wire Analog (GR-506-CORE)	Yes	Certified	Met all CRs and FRs.
ISDN BRI NI 1/2 (ANSI T1.619a)	No	Certified	Met all CRs and FRs with the following exception: SUT only supports an S/T ISDN BRI 4-Wire interface. The operational impact is minor.
DSN Features and Capabilities			
Features and Capabilities	Critical	Status	Remarks
Common Features	No	Certified	Met all CRs and FRs.
Attendant	No	Certified	Met all CRs and FRs with a single console.
Public Safety	No	Certified	Met all CRs and FRs.
Preset Conferencing	No	Not Supported	This feature is not supported. There is no operational impact because it is not a critical requirement for a PBX 1.
Nailed-up Connections	No	Not Supported	This feature is not supported. There is no operational impact because it is not a critical requirement for a PBX 1.
PAT	No	Not Supported	This feature is not supported. There is no operational impact because it is not a critical requirement for a PBX 1.
DSN Hotline Services	No	Certified	Met all CRs and FRs.
Network Management	No	Certified	Met all CRs and FRs.
ISDN Services (EKTS)	No	Not Supported	This feature is not supported. There is no operational impact because it is not a critical requirement for a PBX 1.
Synchronization	Yes	Certified	Met all CRs and FRs.
Reliability	Yes	Certified	Met all CRs and FRs.
Security	Yes	See note 1.	

Table 1. SUT Interoperability Test Summary (continued)

Network Gateways																																								
	Interface & Signaling	Critical	Status	Remarks																																				
PSTN	T1 CAS (DTMF, MFR1, DP)	No	Certified	Met all CRs and FRs.																																				
	E1 CAS (DTMF, MFR1, DP)	No (Europe only)	Certified	Met all CRs and FRs.																																				
	T1 ISDN PRI NI 1/2 (ANSI T1.607)	No	Certified	Met all CRs and FRs.																																				
	E1 ISDN PRI (ITU-T Q.931)	No (Europe only)	Certified	Met all CRs and FRs.																																				
DRSN	TPC 2-Wire Analog (GR-506-CORE)	Yes	Certified ²	Met all CRs and FRs.																																				
<p>LEGEND:</p> <table border="0"> <tr> <td>ANSI - American National Standards Institute</td> <td>MFR1 - Multifrequency Recommendation 1</td> </tr> <tr> <td>BRI - Basic Rate Interface</td> <td>MLPP - Multi-Level Precedence and Preemption</td> </tr> <tr> <td>CAS - Channel Associated Signaling</td> <td>NI 1/2 - National ISDN 1 or 2</td> </tr> <tr> <td>CRs - Capability Requirements</td> <td>PAT - Precedence Access Threshold</td> </tr> <tr> <td>DISA - Defense Information Systems Agency</td> <td>PBX 1 - Private Branch Exchange 1</td> </tr> <tr> <td>DITSCAP - Department of Defense Information Technology Security Certification and Accreditation Process</td> <td>PM - Program Manager</td> </tr> <tr> <td>DP - Dial Pulse</td> <td>PRI - Primary Rate Interface</td> </tr> <tr> <td>DRSN - Defense Red Switch Network</td> <td>PSTN - Public Switched Telephone Network</td> </tr> <tr> <td>DSN - Defense Switched Network</td> <td>Q.931 - Signaling Standard for ISDN</td> </tr> <tr> <td>DSSI - Digital Subscriber Signaling 1</td> <td>Q.955.3 - ISDN Signaling standard for E1 MLPP</td> </tr> <tr> <td>DTMF - Dual Tone Multi-Frequency</td> <td>SS7 - Signaling System 7</td> </tr> <tr> <td>E1 - European Basic Multiplex Rate (2.048 Mbps)</td> <td>S/T - ISDN BRI 4-Wire Interface</td> </tr> <tr> <td>EKTS - Electronic Key Telephone System</td> <td>SUT - System Under Test</td> </tr> <tr> <td>FRs - Feature Requirements</td> <td>T1 - Digital Transmission Link Level 1 (1.544 Mbps)</td> </tr> <tr> <td>GR - Generic Requirement</td> <td>T1.607 - ISDN - Layer 3 Signaling Specification for Circuit Switched Bearer Service for DSSI</td> </tr> <tr> <td>ISDN - Integrated Services Digital Network</td> <td>T1.619a - SS7 and ISDN MLPP Signaling Standard For T1</td> </tr> <tr> <td>ITU-T - International Telecommunication Union – Telecommunication Standardization Sector</td> <td>TPC - Twisted Pair Copper</td> </tr> <tr> <td>Mbps - Megabits per second</td> <td></td> </tr> </table> <p>NOTES:</p> <p>1 DITSCAP information assurance testing is accomplished via DISA-led Information Assurance test teams and published in a separate report.</p> <p>2 Interoperability certification of the SUT does not constitute DRSN PM approval for connectivity to the DRSN. It is the user's responsibility to request connectivity approval directly from the PM.</p>					ANSI - American National Standards Institute	MFR1 - Multifrequency Recommendation 1	BRI - Basic Rate Interface	MLPP - Multi-Level Precedence and Preemption	CAS - Channel Associated Signaling	NI 1/2 - National ISDN 1 or 2	CRs - Capability Requirements	PAT - Precedence Access Threshold	DISA - Defense Information Systems Agency	PBX 1 - Private Branch Exchange 1	DITSCAP - Department of Defense Information Technology Security Certification and Accreditation Process	PM - Program Manager	DP - Dial Pulse	PRI - Primary Rate Interface	DRSN - Defense Red Switch Network	PSTN - Public Switched Telephone Network	DSN - Defense Switched Network	Q.931 - Signaling Standard for ISDN	DSSI - Digital Subscriber Signaling 1	Q.955.3 - ISDN Signaling standard for E1 MLPP	DTMF - Dual Tone Multi-Frequency	SS7 - Signaling System 7	E1 - European Basic Multiplex Rate (2.048 Mbps)	S/T - ISDN BRI 4-Wire Interface	EKTS - Electronic Key Telephone System	SUT - System Under Test	FRs - Feature Requirements	T1 - Digital Transmission Link Level 1 (1.544 Mbps)	GR - Generic Requirement	T1.607 - ISDN - Layer 3 Signaling Specification for Circuit Switched Bearer Service for DSSI	ISDN - Integrated Services Digital Network	T1.619a - SS7 and ISDN MLPP Signaling Standard For T1	ITU-T - International Telecommunication Union – Telecommunication Standardization Sector	TPC - Twisted Pair Copper	Mbps - Megabits per second	
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Table 2. PBX 1 Requirements

DSN Trunk Interfaces				
Interface	Critical	Requirements Required or Conditional		References
T1 CAS (DTMF, MFR1, DP)	No	Trunking	<ul style="list-style-type: none"> Framing (R) Line Code (R) Signaling (R) Alarms (R) WWNDP (R) Outpulsing digit formats (C: CAS only) Routing (C) Trunk Groups (C) Call Processing (C) CAS to CCS trunk interworking (C) PCM-24/PCM-30 Interoperation (C) Direct Inward Dialing (C) 	<ul style="list-style-type: none"> GSCR Sect. 7 GSCR Sect. 7 GSCR Sect. 5 GSCR Sect. 2.5.7, 7.1.4 & 7.2.2 GSCR Sect. 4.5.1 GSCR Sect. 4.5.2 GSCR Sect. 4.2 GSCR Sect. 2.5.5 & 2.5.6 GSCR Sect. 4 GSCR Sect. 3.10 GSCR Sect. 7.3 GSCR Sect 2.3.2
E1 CAS (DTMF, MFR1, DP)	No (Europe only)		Voice	<ul style="list-style-type: none"> MOS (R) MLPP (R) Secure calls (R)
T1 ISDN PRI NI 1/2 (ANSI T1.619a)	Yes	Facsimile	<ul style="list-style-type: none"> Analog: TIA/EIA-465-A (R) 	<ul style="list-style-type: none"> DISR
E1 ISDN PRI (ITU-T Q.955.3)	No	Data	<ul style="list-style-type: none"> Modem (VBD) (R) 56-kbps switched data (R: ISDN PRI only) 64-kbps switched data (R: ISDN PRI only) NX56 synchronous BER (R: ISDN PRI only) NX64 synchronous BER (R: ISDN PRI only) Secure data (STE/STU-III) (R) 	<ul style="list-style-type: none"> CJCSI 6215.01B GSCR Sect. 3.10
		VTC	<ul style="list-style-type: none"> ITU-T H.320 (C: ISDN PRI only) 	<ul style="list-style-type: none"> DISR
DSN Line Interfaces				
2-Wire Analog (GR-506-CORE)	Yes	Access	<ul style="list-style-type: none"> DN Identification (R) Line signaling (R) Alerting Signals and Tones (R) WWNDP (R) Call Treatments (R) 2W user access (R: 2-Wire Analog only) Analog busy/idle (R: 2-Wire Analog only) 	<ul style="list-style-type: none"> GSCR Sect. 2.1.1 GSCR Sect. 5.2 GSCR Sect. 5.5 GSCR Sect. 4.5 GSCR Sect. 4.1 GSCR Sect. 4.3.3 GSCR Sect. 4.3.4.1
		Voice	<ul style="list-style-type: none"> MOS (R) Announcements (R) MLPP (R) Secure Calls (R) 	<ul style="list-style-type: none"> CJCSI 6215.01B GSCR Sect. 3.1.3 GSCR Sect. 3.4.3, 3.9 CJCSI 6215.01B
		Facsimile	<ul style="list-style-type: none"> Analog: TIA/EIA-465-A (R) 	<ul style="list-style-type: none"> DISR
ISDN BRI NI 1/2	No	Data	<ul style="list-style-type: none"> Modem (VBD) (R) 56-kbps switched data (R: ISDN BRI only) 64-kbps switched data (R: ISDN BRI only) NX56 synchronous BER (R: ISDN BRI only) NX64 synchronous BER (R: ISDN BRI only) Secure data (STE/STU-III) (R) 	<ul style="list-style-type: none"> CJCSI 6215.01B GSCR Sect. 3.10
		VTC	<ul style="list-style-type: none"> ITU-T H.320 (R: ISDN BRI only) 	<ul style="list-style-type: none"> DISR

Table 2. PBX 1 Requirements (continued)

DSN Features & Capabilities			
Feature/ Capability	Critical	Requirements Required or Conditional	References
Common Features	No	<ul style="list-style-type: none"> • Selective call rejection (C) • Denied originating service (C) • Code restriction and diversion (C) • Call waiting (C) • Three-way calling (C) • Add-on transfer, conference calling, and call hold (C) • Call forwarding (C) • Call pick-up (C) 	<ul style="list-style-type: none"> • GSCR Sect. 2.1.2 • GSCR Sect. 2.1.3 • GSCR Sect. 2.1.4 • GSCR Sect. 2.1.5 • GSCR Sect. 2.1.6 • GSCR Sect. 2.1.7 • GSCR Sect. 2.1.8 • GSCR Sect. 2.1.9
Attendant	No	<ul style="list-style-type: none"> • Initiate all precedence levels (C) • Visual display (C) • Override class of service (C) • Override busy line (C) • Call deflection (C) • Auto recall (C) • Waiting queue (C) 	<ul style="list-style-type: none"> • GSCR Sect. 2.2.1 • GSCR Sect. 2.2.2 • GSCR Sect. 2.2.3 • GSCR Sect. 2.2.4 • GSCR Sect. 2.2.5 • GSCR Sect. 2.2.6 • GSCR Sect. 2.2.7
Public Safety	No	<ul style="list-style-type: none"> • 911 (C) • Trace of terminating calls (C) • Outgoing call trace (C) • Tandem call trace (C) • Trace of a call in progress (C) 	<ul style="list-style-type: none"> • GSCR Sect. 2.4.1 • GSCR Sect. 2.4.2 • GSCR Sect. 2.4.3 • GSCR Sect. 2.4.4 • GSCR Sect. 2.4.5
Preset Conferencing	No	<ul style="list-style-type: none"> • Support 10 bridges; 1 originator and 20 conferees per bridge (C) • Assign up to 20 address numbers per bridge (C) • Use KXX codes for bridge access (C) • Conference notification recorded announcement (C) • Auto retrieval and alternate address (C) • Bridge release (C) • Lost connection (C) • Secondary conferencing (C) • Address translation (C) 	<ul style="list-style-type: none"> • GSCR Sect. 2.6 • GSCR Sect. 2.6 • GSCR Sect. 2.6 • GSCR Sect. 2.6.1 • GSCR Sect. 2.6.2 • GSCR Sect. 2.6.3 • GSCR Sect. 2.6.4 • GSCR Sect. 2.6.5 • GSCR Sect. 2.7
Nailed-up Connections	No	<ul style="list-style-type: none"> • Between any two like terminations (C) • PCM-24 and PCM-30, both CAS and CCS (C) • Supervision passed end-to-end for A/D or D/A (C) • Monitored and auto reconfigure (C) • Support at least 10% of circuits as nailed-up (C) • Non-preemptable (C) 	<ul style="list-style-type: none"> • GSCR Sect. 2.8
PAT	No	<ul style="list-style-type: none"> • Classmark for/not for PAT screening (C) • 7 PAT mechanisms (C) • Outgoing call screening (C) • Functional structure (C) • Simultaneous calls limitation (C) • Overflow process (C) • Decrementing call-in-progress count (C) • Call treatment (C) • Queuing (C) • Attendant calls (C) • Operation measurement registers (C) • Maintenance and Administration of thresholds (C) 	<ul style="list-style-type: none"> • GSCR Sect. 2.11.1 • GSCR Sect. 2.11.1 • GSCR Sect. 2.11.1.1 • GSCR Sect. 2.11.1.2 • GSCR Sect. 2.11.1.3 • GSCR Sect. 2.11.1.4 • GSCR Sect. 2.11.1.5 • GSCR Sect. 2.11.1.6 • GSCR Sect. 2.11.1.7 • GSCR Sect. 2.11.1.8 • GSCR Sect. 2.11.1.9 • GSCR Sect. 2.11.1.10
DSN Hotline Services	No	<ul style="list-style-type: none"> • Hotline restrictions (C) • Auto initiate (C) • Analog and digital (C) • Subscription basis (C) • Protected hotline calling (C) • WWNDP interoperable (C) 	<ul style="list-style-type: none"> • GSCR Sect. 2.12 • GSCR Sect. 2.12 • GSCR Sect. 2.12 • GSCR Sect. 2.12 • GSCR Sect. 2.12.1-4 • GSCR Sect. 2.12.5

Table 2. PBX 1 Requirements (continued)

DSN Features & Capabilities (continued)				
Feature/ Capability	Critical	Requirements Required or Conditional		References
Network Management	No	<ul style="list-style-type: none"> • Interfaces (C) • Measurements and data generation (C) • Fault management (C) • Configuration management (C) • Accounting management (C) • Performance management (C) • NM controls (C) • Remote access (C) 		<ul style="list-style-type: none"> • GSCR Sect. 9.1 • GSCR Sect. 9.2 • GSCR Sect. 9.3 • GSCR Sect. 9.4 • GSCR Sect. 9.5 • GSCR Sect. 9.6 • GSCR Sect. 9.7 • GSCR Sect. 9.8
ISDN Services	No	<ul style="list-style-type: none"> • EKTS (C) 		<ul style="list-style-type: none"> • GSCR Sect. 10, table 10-3
Synchronization	Yes	<ul style="list-style-type: none"> • Line timing mode (R) • Internal Stratum 4 (R) 		<ul style="list-style-type: none"> • GSCR Sect. 11.1.1.2 • GSCR Sect. 11.1.2.2
Reliability	Yes	<ul style="list-style-type: none"> • GR-512-CORE (R) 		<ul style="list-style-type: none"> • GSCR Sect.12
Security ¹	Yes	<ul style="list-style-type: none"> • DITSCAP (R) 		<ul style="list-style-type: none"> • GSCR Sect. 13
VoIP				
VoIP System	No	<p>VoIP function is conditional. If VoIP is provided, all of the following requirements must be met:</p> <ul style="list-style-type: none"> • MOS 4.0 or better • ITU-T G.711 PCM Codec • Security in accordance with DITSCAP • NM • Line timing • Internal Clock • Latency ≤ 60 ms • IPv6 capable 		<ul style="list-style-type: none"> • GSCR App. 3
LANs	No	<p>VoIP function is conditional. If VoIP is provided, all of the following requirements must be met:</p> <ul style="list-style-type: none"> • LAN parameters • CoS/QoS • VLANs • IEEE Standards Conformance • .99999 availability • Modular devices • 2 second link restoral • LAN NM • Traffic Engineering 		<ul style="list-style-type: none"> • GSCR App. 3
Network Gateways				
Gateway	Critical	Requirements Required or Conditional		References
PSTN	No	Trunking	<ul style="list-style-type: none"> • Positive Identification Control (C) • On-Netting (C) • Off-Netting (C) 	<ul style="list-style-type: none"> • CJCSI 6215.01B • CJCSI 6215.01B • CJCSI 6215.01B
DRSN ²	Yes	Access	<ul style="list-style-type: none"> • Alerting Signals and Tones (R) • Call Processing (R) • Call Treatments (R) • Analog busy/idle (R) 	<ul style="list-style-type: none"> • GSCR Sect. 5.5 • GSCR Sect. 4.4 • GSCR Sect. 4.1 • GSCR Sect. 4.3.4.1
		Voice	<ul style="list-style-type: none"> • MOS (C) • MLPP (C) • Secure calls (C) 	<ul style="list-style-type: none"> • CJCSI 6215.01B • GSCR Sect. 3 • CJCSI 6215.01B

Table 2. PBX 1 Requirements (continued)

LEGEND:	
2W	- 2-Wire
911	- 911 Emergency Service
A/D	- Analog to Digital
ANSI	- American National Standards Institute
App	- Appendix
BER	- Bit Error Ratio
BRI	- Basic Rate Interface
CAS	- Channel Associated Signaling
CCS	- Common Channel Signaling
CJCSI	- Chairman of the Joint Chiefs of Staff Instruction
CoS	- Class of Service
C	- Conditional
D/A	- Digital to Analog
DISA	- Defense Information Systems Agency
DISR	- Department of Defense Information Technology Standards Registry
DITSCAP	- Department of Defense Information Technology Security Certification and Accreditation Process
DN	- Directory Number
DP	- Dial Pulse
DRSN	- Defense Red Switch Network
DSN	- Defense Switched Network
DTMF	- Dual Tone Multi-Frequency
E1	- European Basic Multiplex Rate (2.048 Mbps)
EIA	- Electronic Industries Alliance
EKTS	- Electronic Key Telephone System
G.711	- PCM of Voice Frequencies
GR	- Generic Requirement
GSCR	- Generic Switching Center Requirements
H.320	- Standard for Narrowband VTC
IEEE	- Institute of Electrical and Electronics Engineers, Inc.
IPv6	- Internet Protocol version 6
ISDN	- Integrated Services Digital Network
ITU-T	- International Telecommunication Union-Telecommunication Standardization Sector
kbps	- kilobits per second
KXX	- K= any number 2-8; X= any number 1-9
LAN	- Local Area Network
Mbps	- Megabits per second
MFR1	- Multi-Frequency Recommendation 1
MLPP	- Multi-Level Precedence and Preemption
MOS	- Mean Opinion Score
ms	- milliseconds
NI 1/2	- National ISDN 1 or 2
NM	- Network Management
NX56	- Data format restricted to multiples of 56 kbps
NX64	- Data format restricted to multiples of 64 kbps
PAT	- Precedence Access Threshold
PBX 1	- Private Branch Exchange 1
PCM	- Pulse Code Modulation
PCM-24	- Pulse Code Modulation - 24 Channels
PCM-30	- Pulse Code Modulation - 30 Channels
PRI	- Primary Rate Interface
PSTN	- Public Switched Telephone Network
Q.955.3	- ISDN Signaling standard for E1 MLPP
QoS	- Quality of Service
R	- Required
Sect.	- section
SS7	- Signaling System 7
STE	- Secure Terminal Equipment
STU-III	- Secure Telephone Unit-3 rd generation
T1	- Digital Transmission Link Level 1 (1.544 Mbps)
T1.619a	- SS7 and ISDN MLPP Signaling Standard For T1
TIA	- Telecommunications Industry Association
TIA/EIA-465-A	- Group 3 Facsimile Apparatus for Document Transmission
VBD	- Variable bit data
VLAN	- Virtual Local Area Network
VoIP	- Voice over Internet Protocol
VTC	- Video Teleconferencing
WWNDP	- Worldwide Numbering and Dialing Plan

NOTES:
 1 DITSCAP information assurance testing is accomplished via DISA-led Information Assurance test teams and published in a separate report.
 2 Facsimile, data, and VTC services are not provided via the DSN to DRSN interface.

5. No detailed test report was developed in accordance with the Program Manager's request. JITC distributes interoperability information via the JITC Electronic Report Distribution (ERD) system, which uses Unclassified-But-Sensitive Internet Protocol Router Network (NIPRNet) e-mail. More comprehensive interoperability status information is available via the JITC System Tracking Program (STP). The STP is accessible by .mil/gov users on the NIPRNet at <https://stp.fhu.disa.mil>. Test reports, lessons learned, and related testing documents and references are on the JITC Joint Interoperability Tool (JIT) at <http://jit.fhu.disa.mil> (NIPRNet), or <http://199.208.204.125> (SIPRNet). Information related to DSN testing is on the Telecom Switched Services Interoperability (TSSI) website at <http://jitc.fhu.disa.mil/tssi>.

6. The JITC point of contact is Capt. Michel Roy, DSN 821-8575, commercial (520) 533-8575, FAX DSN 879-4347, or e-mail to michel.roy.ca@disa.mil.

FOR THE COMMANDER:



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2 Enclosures a/s

JITC Memo, JTE, Special Interoperability Test Certification of Redcom Laboratories Inc. Slice™
Digital Switching System with Software Version 1.0A R1P3, Build 23 August 2005

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700, 1931 Jefferson-Davis Hwy, Arlington, VA 22202

Office of Under Secretary of Defense, OUSD (AT&L), Room 3E144, 3070 Defense Pentagon,
Washington, DC 20301

US Joint Forces Command, J6I, C4 Plans and Policy, 1562 Mitscher Ave, Norfolk, VA 23551-
2488

Defense Intelligence Agency, ATTN: DS-CIO, Bldg 6000, Bolling AFB, Washington, DC
20340-3342

National Security Agency, ATTN: DT, Suite 6496, 9800 Savage Road, Fort Meade, MD
20755-6496

Defense Information Systems Agency (DISA), ATTN: GS23 (Mr. Osman), Room 5w23, 5275
Leesburg Pike (RTE 7), Falls Church, VA 22041

ADDITIONAL REFERENCES

- (c) Chairman of the Joint Chiefs of Staff Instruction (CJCSI) 6215.01B, "Policy for Department of Defense Voice Services," 23 September 2001
- (d) Defense Information Systems Agency (DISA), "Defense Switched Network (DSN) Generic Switching Center Requirements (GSCR), Incorporated Change 1," 1 March 2005
- (e) Joint Interoperability Test Command, "Defense Switched Network Generic Switch Test Plan (GSTP)," 23 April 2004

CERTIFICATION TESTING SUMMARY

1. SYSTEM TITLE. Special Interoperability Test Certification of Redcom Laboratories Inc. Slice™ Digital Switching System with Software Version 1.0A R1P3, Build 23 August 2005, hereinafter referred to as the system under test (SUT).

2. PROPONENT. Defense Information Systems Agency (DISA).

3. PROGRAM MANAGER. Mr. Howard Osman, GS23, Room 5W23, 5275 Leesburg Pike, Falls Church, VA 22041, E-mail: Howard.Osman@disa.mil.

4. TESTER. Joint Interoperability Test Command (JITC), Fort Huachuca, Arizona.

5. SYSTEM UNDER TEST DESCRIPTION. The SUT is suited for small stand-alone or remote applications. The SUT is a Private Branch Exchange (PBX) 1 which supports American National Standards Institute (ANSI) T1.619a Digital Transmission Link Level 1 (T1) Integrated Services Digital Network (ISDN) Primary Rate Interface (PRI) National ISDN 1 or 2 (NI 1/2) and International Telecommunication Union - Telecommunication Standardization Sector (ITU-T) Q.955.3 European Basic Multiplex Rate (E1) PRI ISDN. The SUT supports T1 and E1 Channel Associated Signaling (CAS). The SUT is in a one "U" (1.75 in.) rack-mountable package. A single one "U" unit provides 24 analog line circuits, 4 Basic Rate Interface (BRI)-S/T line circuits and 2 digital spans (E1/T1). The SUT must be configured to use either mu-law (T1 interfaces) or A-law (E1 interfaces) digital voice waveform encoding. The SUT allows full integration of Slices™ with each other or with the larger High-Density Exchange (HDX). The SUT does not offer an ISDN BRI U (2-wire ISDN interface). The SUT offers voice over Internet Protocol (VoIP), however, this feature was not tested and is not covered under this certification.

6. OPERATIONAL ARCHITECTURE. The Defense Switched Network (DSN) architecture is a two-level network hierarchy consisting of DSN backbone switches and Service/Agency installation switches. Joint Staff policy and subscriber mission requirements determine which type of switch can be used at a particular location. The DSN architecture, therefore, consists of several categories of switches including PBXs. The Generic Switching Center Requirements (GSCR) operational DSN Architecture is depicted in figure 2-1. The architecture depicts the relationship of Military Department PBX 1s to the other DSN switch types.

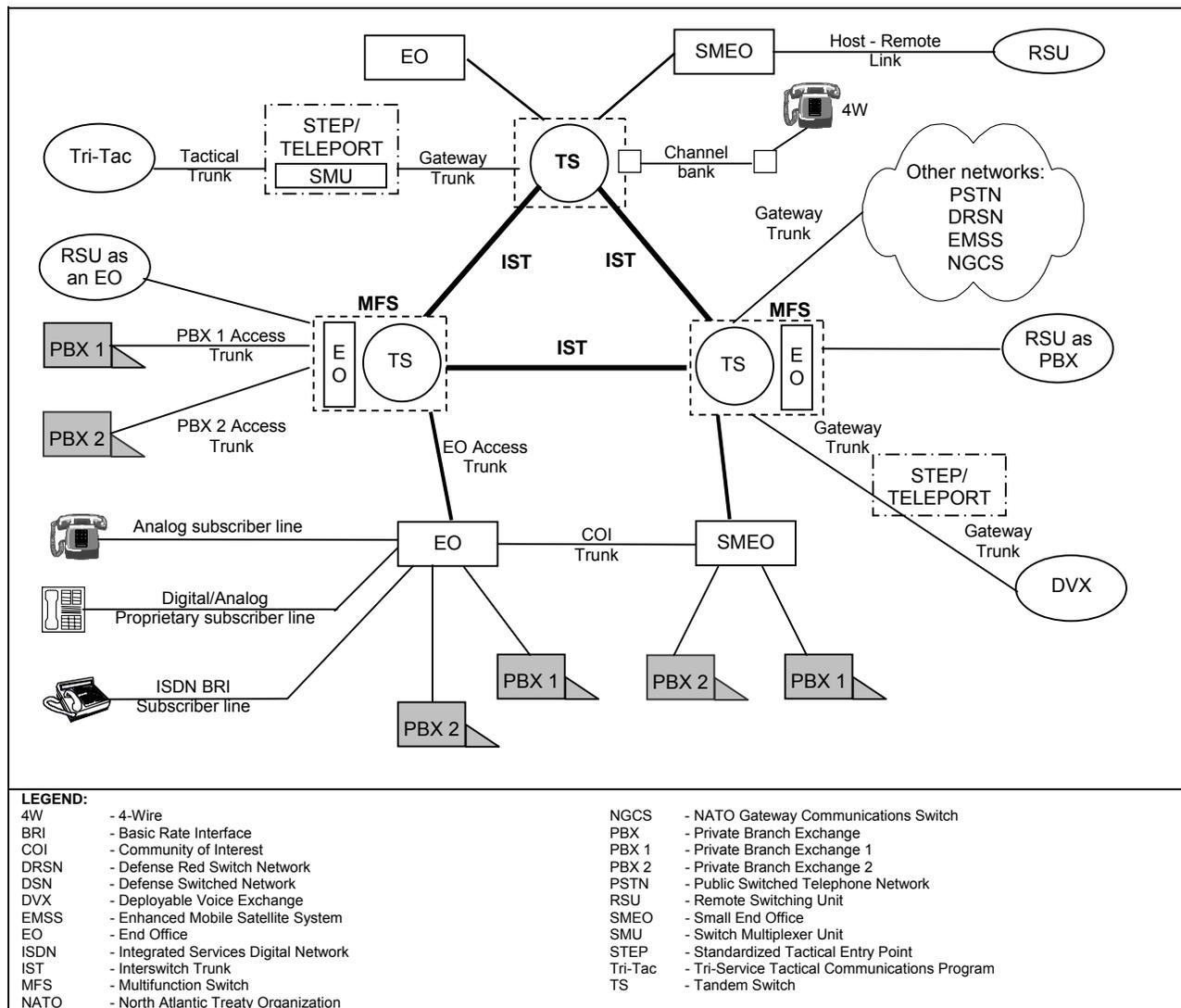


Figure 2-1. DSN Architecture

7. REQUIRED SYSTEM INTERFACES. Requirements specific to PBX 1s are listed in table 2-1. If a switch satisfies PBX 1 criteria, it will satisfy the lesser standards of a PBX 2. These requirements are derived from:

- a. DSN services for Network and Applications specified in Chairman of the Joint Chiefs of Staff Instruction (CJCSI) 6215.01B, "Policy for Department of Defense Voice Services."
- b. GSCR interface and signaling requirements for trunks/lines verified through JITC testing and/or vendor submission of Letter(s) of Compliance (LoC).

c. GSCR PBX 1 Capability Requirements (CRs) and Feature Requirements (FRs) verified through JITC testing and/or vendor submission of LoC.

Table 2-1. PBX 1 Requirements

DSN Trunk Interfaces				
Interface	Critical	Requirements Required or Conditional		References
T1 CAS (DTMF, MFR1, DP)	No	Trunking	<ul style="list-style-type: none"> Framing (R) Line Code (R) Signaling (R) Alarms (R) WWNDP (R) Outpulsing digit formats (C: CAS only) Routing (C) Trunk Groups (C) Call Processing (C) CAS to CCS trunk interworking (C) PCM-24/PCM-30 Interoperation (C) Direct Inward Dialing (C) 	<ul style="list-style-type: none"> GSCR Sect. 7 GSCR Sect. 7 GSCR Sect. 5 GSCR Sect. 2.5.7, 7.1.4 & 7.2.2 GSCR Sect. 4.5.1 GSCR Sect. 4.5.2 GSCR Sect. 4.2 GSCR Sect. 2.5.5 & 2.5.6 GSCR Sect. 4 GSCR Sect. 3.10 GSCR Sect. 7.3 GSCR Sect 2.3.2
E1 CAS (DTMF, MFR1, DP)	No (Europe only)		Voice	<ul style="list-style-type: none"> MOS (R) MLPP (R) Secure calls (R)
T1 ISDN PRI NI 1/2 (ANSI T1.619a)	Yes	Facsimile	<ul style="list-style-type: none"> Analog: TIA/EIA-465-A (R) 	<ul style="list-style-type: none"> DISR
E1 ISDN PRI (ITU-T Q.955.3)	No (Europe only)	Data	<ul style="list-style-type: none"> Modem (VBD) (R) 56-kbps switched data (R: ISDN PRI only) 64-kbps switched data (R: ISDN PRI only) NX56 synchronous BER (R: ISDN PRI only) NX64 synchronous BER (R: ISDN PRI only) Secure data (STE/STU-III) (R) 	<ul style="list-style-type: none"> CJCSI 6215.01B GSCR Sect. 3.10
		VTC	<ul style="list-style-type: none"> ITU-T H.320 (C: ISDN PRI only) 	<ul style="list-style-type: none"> DISR
DSN Line Interfaces				
2-Wire Analog (GR-506-CORE)	Yes	Access	<ul style="list-style-type: none"> DN Identification (R) Line signaling (R) Alerting Signals and Tones (R) WWNDP (R) Call Treatments (R) 2W user access (R: 2-Wire Analog only) Analog busy/idle (R: 2-Wire Analog only) 	<ul style="list-style-type: none"> GSCR Sect. 2.1.1 GSCR Sect. 5.2 GSCR Sect. 5.5 GSCR Sect. 4.5 GSCR Sect. 4.1 GSCR Sect. 4.3.3 GSCR Sect. 4.3.4.1
		Voice	<ul style="list-style-type: none"> MOS (R) MLPP (R) Secure Calls (R) 	<ul style="list-style-type: none"> CJCSI 6215.01B GSCR Sect. 3.4.3, 3.9 CJCSI 6215.01B
		Facsimile	<ul style="list-style-type: none"> Analog: TIA/EIA-465-A (R) 	<ul style="list-style-type: none"> DISR
ISDN BRI NI 1/2	No	Data	<ul style="list-style-type: none"> Modem (VBD) (R) 56-kbps switched data (R: ISDN BRI only) 64-kbps switched data (R: ISDN BRI only) NX56 synchronous BER (R: ISDN BRI only) NX64 synchronous BER (R: ISDN BRI only) Secure data (STE/STU-III) (R) 	<ul style="list-style-type: none"> CJCSI 6215.01B GSCR Sect. 3.10
		VTC	<ul style="list-style-type: none"> ITU-T H.320 (R: ISDN BRI only) 	<ul style="list-style-type: none"> DISR

Table 2-1. PBX 1 Requirements (continued)

DSN Features & Capabilities			
Feature/ Capability	Critical	Requirements Required or Conditional	References
Common Features	No	<ul style="list-style-type: none"> • Selective call rejection (C) • Denied originating service (C) • Code restriction and diversion (C) • Call waiting (C) • Three-way calling (C) • Add-on transfer, conference calling, and call hold (C) • Call forwarding (C) • Call pick-up (C) 	<ul style="list-style-type: none"> • GSCR Sect. 2.1.2 • GSCR Sect. 2.1.3 • GSCR Sect. 2.1.4 • GSCR Sect. 2.1.5 • GSCR Sect. 2.1.6 • GSCR Sect. 2.1.7 • GSCR Sect. 2.1.8 • GSCR Sect. 2.1.9
Attendant	No	<ul style="list-style-type: none"> • Initiate all precedence levels (C) • Visual display (C) • Override class of service (C) • Override busy line (C) • Call deflection (C) • Auto recall (C) • Waiting queue (C) 	<ul style="list-style-type: none"> • GSCR Sect. 2.2.1 • GSCR Sect. 2.2.2 • GSCR Sect. 2.2.3 • GSCR Sect. 2.2.4 • GSCR Sect. 2.2.5 • GSCR Sect. 2.2.6 • GSCR Sect. 2.2.7
Public Safety	No	<ul style="list-style-type: none"> • 911 (C) • Trace of terminating calls (C) • Outgoing call trace (C) • Tandem call trace (C) • Trace of a call in progress (C) 	<ul style="list-style-type: none"> • GSCR Sect. 2.4.1 • GSCR Sect. 2.4.2 • GSCR Sect. 2.4.3 • GSCR Sect. 2.4.4 • GSCR Sect. 2.4.5
Preset Conferencing	No	<ul style="list-style-type: none"> • Support 10 bridges; 1 originator and 20 conferees per bridge (C) • Assign up to 20 address numbers per bridge (C) • Use KXX codes for bridge access (C) • Conference notification recorded announcement (C) • Auto retrieval and alternate address (C) • Bridge release (C) • Lost connection (C) • Secondary conferencing (C) • Address translation (C) 	<ul style="list-style-type: none"> • GSCR Sect. 2.6 • GSCR Sect. 2.6 • GSCR Sect. 2.6 • GSCR Sect. 2.6.1 • GSCR Sect. 2.6.2 • GSCR Sect. 2.6.3 • GSCR Sect. 2.6.4 • GSCR Sect. 2.6.5 • GSCR Sect. 2.7
Nailed-up Connections	No	<ul style="list-style-type: none"> • Between any two like terminations (C) • PCM-24 and PCM-30, both CAS and CCS (C) • Supervision passed end-to-end for A/D or D/A (C) • Monitored and auto reconfigure (C) • Support at least 10% of circuits as nailed-up (C) • Non-preemptable (C) 	<ul style="list-style-type: none"> • GSCR Sect. 2.8
PAT	No	<ul style="list-style-type: none"> • Classmark for/not for PAT screening (C) • 7 PAT mechanisms (C) • Outgoing call screening (C) • Functional structure (C) • Simultaneous calls limitation (C) • Overflow process (C) • Decrementing call-in-progress count (C) • Call treatment (C) • Queuing (C) • Attendant calls (C) • Operation measurement registers (C) • Maintenance and Administration of thresholds (C) 	<ul style="list-style-type: none"> • GSCR Sect. 2.11.1 • GSCR Sect. 2.11.1 • GSCR Sect. 2.11.1.1 • GSCR Sect. 2.11.1.2 • GSCR Sect. 2.11.1.3 • GSCR Sect. 2.11.1.4 • GSCR Sect. 2.11.1.5 • GSCR Sect. 2.11.1.6 • GSCR Sect. 2.11.1.7 • GSCR Sect. 2.11.1.8 • GSCR Sect. 2.11.1.9 • GSCR Sect. 2.11.1.10
DSN Hotline Services	No	<ul style="list-style-type: none"> • Hotline restrictions (C) • Auto initiate (C) • Analog and digital (C) • Subscription basis (C) • Protected hotline calling (C) • WWNDP interoperable (C) 	<ul style="list-style-type: none"> • GSCR Sect. 2.12 • GSCR Sect. 2.12 • GSCR Sect. 2.12 • GSCR Sect. 2.12 • GSCR Sect. 2.12.1-4 • GSCR Sect. 2.12.5

Table 2-1. PBX 1 Requirements (continued)

DSN Features & Capabilities (continued)				
Feature/ Capability	Critical	Requirements Required or Conditional		References
Network Management	No	<ul style="list-style-type: none"> • Interfaces (C) • Measurements and data generation (C) • Fault management (C) • Configuration management (C) • Accounting management (C) • Performance management (C) • NM controls (C) • Remote access (C) 		<ul style="list-style-type: none"> • GSCR Sect. 9.1 • GSCR Sect. 9.2 • GSCR Sect. 9.3 • GSCR Sect. 9.4 • GSCR Sect. 9.5 • GSCR Sect. 9.6 • GSCR Sect. 9.7 • GSCR Sect. 9.8
ISDN Services	No	<ul style="list-style-type: none"> • EKTS (C) 		<ul style="list-style-type: none"> • GSCR Sect. 10, table 10-3
Synchronization	Yes	<ul style="list-style-type: none"> • Line timing mode (R) • Internal Stratum 4 (R) 		<ul style="list-style-type: none"> • GSCR Sect. 11.1.1.2 • GSCR Sect. 11.1.2.2
Reliability	Yes	<ul style="list-style-type: none"> • GR-512-CORE (R) 		<ul style="list-style-type: none"> • GSCR Sect.12
Security ¹	Yes	<ul style="list-style-type: none"> • DITSCAP (R) 		<ul style="list-style-type: none"> • GSCR Sect. 13
VoIP				
VoIP System	No	<p>VoIP function is conditional. If VoIP is provided, all of the following requirements must be met:</p> <ul style="list-style-type: none"> • MOS 4.0 or better • ITU-T G.711 PCM Codec • Security in accordance with DITSCAP • NM • Line timing • Internal Clock • Latency ≤ 60 ms • IPv6 capable 		<ul style="list-style-type: none"> • GSCR App. 3
LANs	No	<p>VoIP function is conditional. If VoIP is provided, all of the following requirements must be met:</p> <ul style="list-style-type: none"> • LAN parameters • CoS/QoS • VLANs • IEEE Standards Conformance • .99999 availability • Modular devices • 2 second link restoral • LAN NM • Traffic Engineering 		<ul style="list-style-type: none"> • GSCR App. 3
Network Gateways				
Gateway	Critical	Requirements Required or Conditional		References
PSTN	No	Trunking	<ul style="list-style-type: none"> • Positive Identification Control (C) • On-Netting (C) • Off-Netting (C) 	<ul style="list-style-type: none"> • CJCSI 6215.01B • CJCSI 6215.01B • CJCSI 6215.01B
DRSN ²	Yes	Access	<ul style="list-style-type: none"> • Alerting Signals and Tones (R) • Call Processing (R) • Call Treatments (R) • Analog busy/idle (R) 	<ul style="list-style-type: none"> • GSCR Sect. 5.5 • GSCR Sect. 4.4 • GSCR Sect. 4.1 • GSCR Sect. 4.3.4.1
		Voice	<ul style="list-style-type: none"> • MOS (C) • MLPP (C) • Secure calls (C) 	<ul style="list-style-type: none"> • CJCSI 6215.01B • GSCR Sect. 3 • CJCSI 6215.01B

Table 2-1. PBX 1 Requirements (continued)

LEGEND:	
2W	- 2-Wire
911	- 911 Emergency Service
A/D	- Analog to Digital
ANSI	- American National Standards Institute
App	- Appendix
BER	- Bit Error Ratio
BRI	- Basic Rate Interface
CAS	- Channel Associated Signaling
CCS	- Common Channel Signaling
CJCSI	- Chairman of the Joint Chiefs of Staff Instruction
CoS	- Class of Service
C	- Conditional
D/A	- Digital to Analog
DISA	- Defense Information Systems Agency
DISR	- Department of Defense Information Technology Standards Registry
DITSCAP	- Department of Defense Information Technology Security Certification and Accreditation Process
DN	- Directory Number
DP	- Dial Pulse
DRSN	- Defense Red Switch Network
DSN	- Defense Switched Network
DTMF	- Dual Tone Multi-Frequency
E1	- European Basic Multiplex Rate (2.048 Mbps)
EIA	- Electronic Industries Alliance
EKTS	- Electronic Key Telephone System
G.711	- PCM of Voice Frequencies
GR	- Generic Requirement
GSCR	- Generic Switching Center Requirements
H.320	- Standard for Narrowband VTC
IEEE	- Institute of Electrical and Electronics Engineers, Inc.
IPv6	- Internet Protocol version 6
ISDN	- Integrated Services Digital Network
ITU-T	- International Telecommunication Union-Telecommunication Standardization Sector
kbps	- kilobits per second
KXX	- K= any number 2-8; X= any number 1-9
LAN	- Local Area Network
Mbps	- Megabits per second
MFR1	- Multi-Frequency Recommendation 1
MLPP	- Multi-Level Precedence and Preemption
MOS	- Mean Opinion Score
ms	- milliseconds
NI 1/2	- National ISDN 1 or 2
NM	- Network Management
NX56	- Data format restricted to multiples of 56 kbps
NX64	- Data format restricted to multiples of 64 kbps
PAT	- Precedence Access Threshold
PBX 1	- Private Branch Exchange 1
PCM	- Pulse Code Modulation
PCM-24	- Pulse Code Modulation - 24 Channels
PCM-30	- Pulse Code Modulation - 30 Channels
PRI	- Primary Rate Interface
PSTN	- Public Switched Telephone Network
Q.955.3	- ISDN Signaling standard for E1 MLPP
QoS	- Quality of Service
R	- Required
Sect.	- section
SS7	- Signaling System 7
STE	- Secure Terminal Equipment
STU-III	- Secure Telephone Unit-3 rd generation
T1	- Digital Transmission Link Level 1 (1.544 Mbps)
T1.619a	- SS7 and ISDN MLPP Signaling Standard For T1
TIA	- Telecommunications Industry Association
TIA/EIA-465-A	- Group 3 Facsimile Apparatus for Document Transmission
VBD	- Variable bit data
VLAN	- Virtual Local Area Network
VoIP	- Voice over Internet Protocol
VTC	- Video Teleconferencing
WWNDP	- Worldwide Numbering and Dialing Plan

NOTES:

1 DITSCAP information assurance testing is accomplished via DISA-led Information Assurance test teams and published in a separate report.

2 Facsimile, data, and VTC services are not provided via the DSN to DRSN interface.

8. TEST NETWORK DESCRIPTION. The SUT was tested at JITC’s Global Information Grid Network Test Facility in a manner and configuration similar to that of the DSN operational environment. Testing of the system’s required functions and features was conducted using the notional test configuration depicted in figure 2-2. The SUT was tested as the end-point in relation to the other switches. Figure 2-3 depicts the test configuration used to test the Advanced Defense Switched Network Integrated Management Support System network management required functions and features.

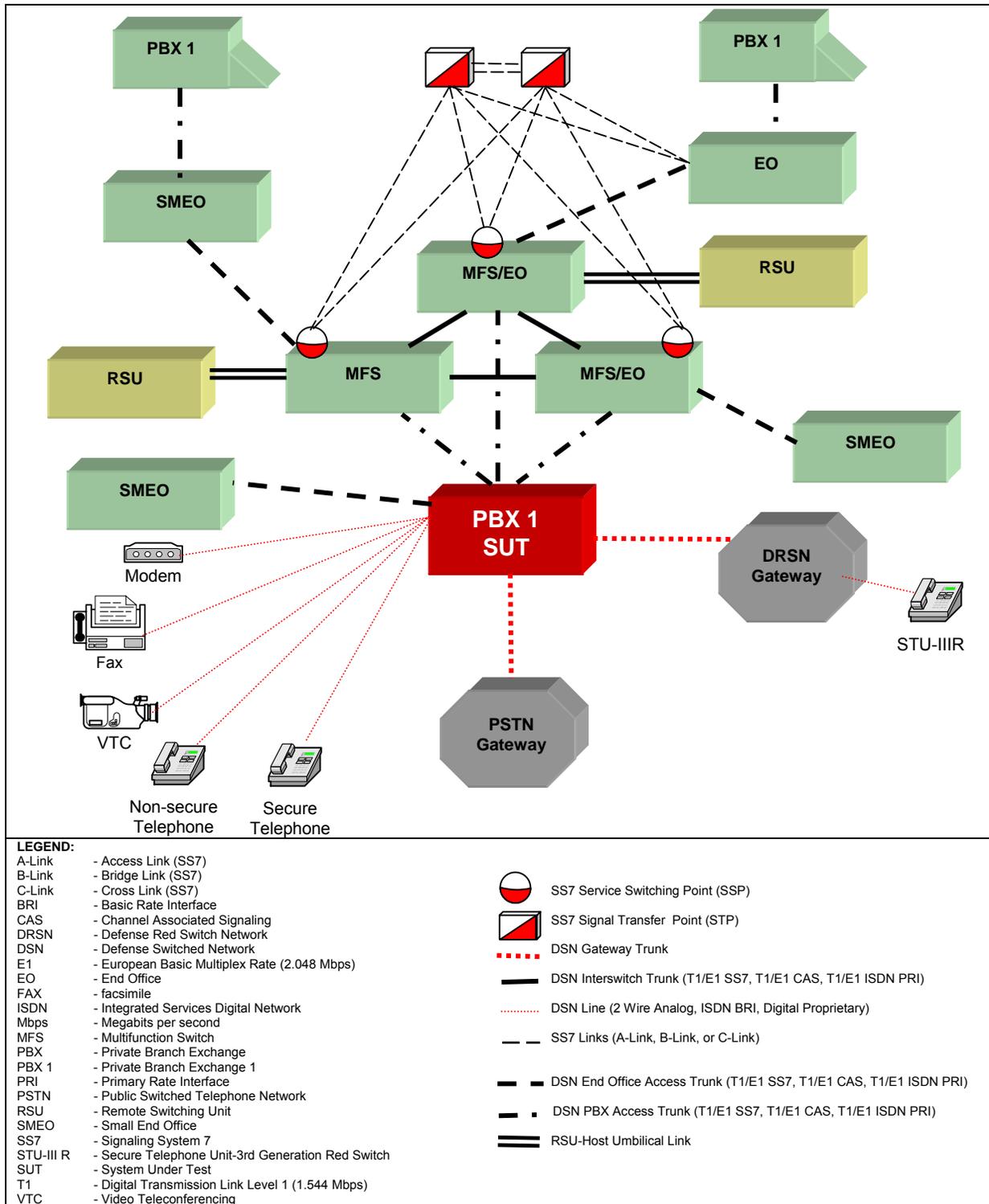


Figure 2-2. Notional Test Configuration

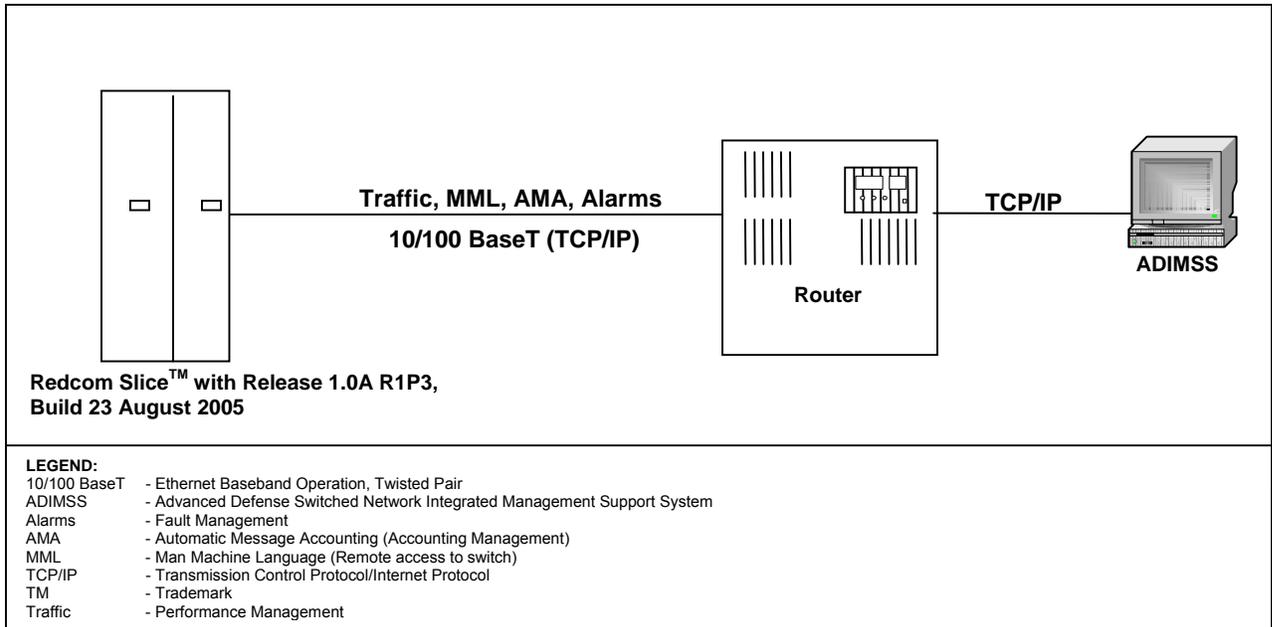


Figure 2-3. Redcom Slice ADIMSS Network Management System Interface

9. SYSTEM CONFIGURATIONS. Table 2-2 provides the hardware and software of the system test configuration.

Table 2-2. System Test Configuration

System Name	Software Release
Nortel Networks MSL-100 (MFS, EO)	SE06
Siemens EWSD (MFS, EO)	19d with Patch Set 43
Avaya S8700 (SMEO, PBX 1, PBX 2)	Communication Manager (CM) 2.01 (R012x.00.1.221.1)
Nortel Networks Option 11C (PBX1, PBX2)	Succession 3.0
Redcom IGX (SMEO, PBX1, PBX2)	6.0A R1P3
SUT	1.0A R1P3, Build 23 August 2005
ISDN Telephone: Tele-Infonet Systems Model VOTPS ISDN S	ETYPE052504.00D
ISDN Telephones: Tone Commander Models: 6220T TSG, 6210T, 6220T	01.06.12
LEGEND:	
EO - End Office	PBX 1 - Private Branch Exchange 1
EWSD - Elektronisches Wählsystem Digital	PBX 2 - Private Branch Exchange 2
IGX - ISDN Gateway Exchange	SE - Succession Enterprise
ISDN - Integrated Services Digital Network	SMEO - Small End Office
MFS - Multifunction Switch	SUT - System Under Test
MSL - Meridian Switching Load	VOTPS - Voice Only Teleset Plus S

10. TESTING LIMITATIONS. None.

11. TEST RESULTS

a. Discussion

(1) DSN Trunk Interfaces. The SUT met all critical CRs and FRs for T1 ISDN PRI NI 1/2 (ANSI T1.619a), E1 ISDN PRI (ITU-T Q.955.3), T1 CAS, and E1 CAS. Detailed trunk configurations and associated lessons learned can be found on the JITC Telecom Switched Services Interoperability (TSSI) program web page: <http://jitic.fhu.disa.mil/tssi>.

(2) DSN Line Interfaces. The SUT met all critical interoperability certification requirements for a 2-Wire Analog (GR-506-CORE) DSN line interface. The SUT met all critical interoperability certification requirements for ISDN BRI with the following exception: under line features, the SUT only meets the requirement to provide a 4-wire (ISDN BRI S/T) interface, the SUT does not offer a 2-wire (ISDN BRI U) interface. Since the ISDN BRI interface is a conditional interface for a PBX 1, the operational impact is minor.

(3) Features and Capabilities. The SUT met all critical interoperability certification requirements for Features and Capabilities.

(4) Network Gateways. The SUT met all critical interoperability certification requirements for the Public Switched Telephone Network and the Defense Red Switch Network Gateways.

(5) Security. Security requirements in accordance with the GSCR, appendix 3, were verified using the Information Assurance Test Plan. Results of the security testing are reported in a separate test report generated by the DISA Information Assurance test personnel.

(6) Network Management (NM). The SUT met all critical interoperability certification requirements for Network Management with a 10/100 BaseT Ethernet interface.

b. System Interoperability Results. The SUT is certified for joint use in the DSN as a PBX 1 and PBX 2 in accordance with the requirements set forth in the GSCR. The identified test discrepancies that remained open after software patches were applied and regression testing was completed have an overall minor operational impact. The interoperability test summary is shown in table 2-3 and the detailed interoperability test status is shown table 2-4.

Table 2-3. SUT Interoperability Test Summary

DSN Trunk Interfaces			
Interface & Signaling	Critical	Status	Remarks
T1 CAS (DTMF, MFR1, DP)	No	Certified	Met all CRs and FRs.
E1 CAS (DTMF, MFR1, DP)	No (Europe only)	Certified	Met all CRs and FRs.
T1 ISDN PRI NI 1/2 (ANSI T1.619a)	Yes	Certified	Met all CRs and FRs.
E1 ISDN PRI (ITU-T Q.955.3)	No (Europe only)	Certified	Met all CRs and FRs.
DSN Line Interfaces			
Interface & Signaling	Critical	Status	Remarks
2-Wire Analog (GR-506-CORE)	Yes	Certified	Met all CRs and FRs.
ISDN BRI NI 1/2 (ANSI T1.619a)	No	Certified	Met all CRs and FRs with the following exception: The SUT only supports an S/T ISDN BRI 4-Wire interface. The operational impact is minor.
DSN Features and Capabilities			
Features and Capabilities	Critical	Status	Remarks
Common Features	No	Certified	Met all CRs and FRs.
Attendant	No	Certified	Met all CRs and FRs with a single console.
Public Safety	No	Certified	Met all CRs and FRs.
Preset Conferencing	No	Not Supported	This feature is not supported. There is no operational impact because it is not a critical requirement for a PBX 1.
Nailed-up Connections	No	Not Supported	This feature is not supported. There is no operational impact because it is not a critical requirement for a PBX 1.
PAT	No	Not Supported	This feature is not supported. There is no operational impact because it is not a critical requirement for a PBX 1.
DSN Hotline Services	No	Certified	Met all CRs and FRs.
Network Management	No	Certified	Met all CRs and FRs.
ISDN Services (EKTS)	No	Not Supported	This feature is not supported. There is no operational impact because it is not a critical requirement for a PBX 1.
Synchronization	Yes	Certified	Met all CRs and FRs.
Reliability	Yes	Certified	Met all CRs and FRs.
Security	Yes	See note 1.	

Table 2-3. SUT Interoperability Test Summary (continued)

Network Gateways				
Gateway	Interface & Signaling	Critical	Status	Remarks
PSTN	T1 CAS (DTMF, MFR1, DP)	No	Certified	Met all CRs and FRs.
	E1 CAS (DTMF, MFR1, DP)	No (Europe only)	Certified	Met all CRs and FRs.
	T1 ISDN PRI NI 1/2 (ANSI T1.607)	No	Certified	Met all CRs and FRs.
	E1 ISDN PRI (ITU-T Q.931)	No (Europe only)	Certified	Met all CRs and FRs.
DRSN	TPC 2-Wire Analog (GR-506-CORE)	Yes	Certified ²	Met all critical CRs and FRs.

LEGEND:

ANSI	- American National Standards Institute	Mbps	- Megabits per second
BRI	- Basic Rate Interface	MFR1	- Multifrequency Recommendation 1
CAS	- Channel Associated Signaling	MLPP	- Multi-Level Precedence and Preemption
CRs	- Capability Requirements	NI 1/2	- National ISDN 1 or 2
DISA	- Defense Information Systems Agency	PAT	- Precedence Access Threshold
DITSCAP	- Department of Defense Information Technology Security Certification and Accreditation Process	PBX 1	- Private Branch Exchange 1
DP	- Dial Pulse	PM	- Program Manager
DRSN	- Defense Red Switch Network	PRI	- Primary Rate Interface
DSN	- Defense Switched Network	PSTN	- Public Switched Telephone Network
DSS1	- Digital Subscriber Signaling 1	Q.931	- Signaling Standard for ISDN
DTMF	- Dual Tone Multi-Frequency	Q.955.3	- ISDN Signaling standard for E1 MLPP
E1	- European Basic Multiplex Rate (2.048 Mbps)	SS7	- Signaling System 7
EKTS	- Electronic Key Telephone System	S/T	- ISDN BRI 4-Wire Interface
FRs	- Feature Requirements	SUT	- System Under Test
GR	- Generic Requirement	T1	- Digital Transmission Link Level 1 (1.544 Mbps)
ISDN	- Integrated Services Digital Network	T1.607	- ISDN - Layer 3 Signaling Specification for Circuit Switched Bearer Service for DSS1
ITU-T	- International Telecommunication Union – Telecommunication Standardization Sector	T1.619a	- SS7 and ISDN MLPP Signaling Standard For T1
		TPC	- Twisted Pair Copper

NOTES:

- DITSCAP information assurance testing is accomplished via DISA-led Information Assurance test teams and published in a separate report.
- Interoperability certification of the SUT does not constitute DRSN PM approval for connectivity to the DRSN. It is the user's responsibility to request connectivity approval directly from the PM.

12. TEST AND ANALYSIS REPORT. No detailed test report was developed in accordance with the Program Manager's request. JITC distributes interoperability information via the JITC Electronic Report Distribution (ERD) system, which uses Unclassified-But-Sensitive Internet Protocol Router Network (NIPRNet) e-mail. More comprehensive interoperability status information is available via the JITC System Tracking Program (STP). The STP is accessible by .mil/gov users on the NIPRNet at <https://stp.fhu.disa.mil>. Test reports, lessons learned, and related testing documents and references are on the JITC Joint Interoperability Tool (JIT) at <http://jit.fhu.disa.mil> (NIPRNet), or <http://199.208.204.125> (SIPRNet). Information related to DSN testing is on the TSSI website at <http://jitic.fhu.disa.mil/tssi>.

Table 2-4. SUT Interoperability Requirements/Status

DSN Trunk Interfaces							
Interface	Critical	Interface Status	GSCR Requirement Required or Conditional		Reference	Test Results	Remarks
T1 CAS	No	Certified	Trunking	Framing (R)	GSCR Sect. 7	Met	
				Line Code (R)	GSCR Sect. 7	Met	
				Signaling (R)	GSCR Sect. 5	Met	
				Alarms (R)	GSCR Sect. 2.5.7, 7.1.4 & 7.2.2	Met	
				WWNDP (R)	GSCR Sect. 4.5.1	Met	
				Outpulsing digit formats (C)	GSCR Sect. 4.5.2	Met	
				Routing (C)	GSCR Sect. 4.2	Met	
				Trunk Groups(C)	GSCR Sect. 2.5.5 & 2.5.6	Met	
				Call Processing (R)	GSCR Sect. 4	Met	
				CAS to CCS trunk interworking (C)	GSCR Sect. 3.10	Met	
				PCM-24/PCM-30 Interoperation(C)	GSCR Sect. 7.3	Met	
			Direct Inward Dialing (C)	GSCR Sect. 2.3.2	Met		
			Voice	MOS (R)	CJCSI 6215.01B	Met	
				MLPP (R)	GSCR Sect. 3	Met	
				Secure calls (R)	CJCSI 6215.01B	Met	
			Facsimile	Analog: TIA/EIA-465-A (R)	DISR	Met	
			Data	Modem (VBD) (R)	CJCSI 6215.01B	Met	
				56-kbps switched data (R: ISDN PRI only)	GSCR Sect. 3.10	Met	
				64-kbps switched data (R: ISDN PRI only)	GSCR Sect. 3.10	Not Tested	Minor ¹
				NX56 synchronous BER (R: ISDN PRI only)	GSCR Sect. 3.10	Met	
				NX64 synchronous BER (R: ISDN PRI only)	GSCR Sect. 3.10	Not Tested	Minor ¹
Secure data (STE/STU-III) (R)	GSCR Sect. 3.10	Met					
VTC	ITU-T H.320 (C: ISDN PRI only)	DISR	Met				

Table 2-4. SUT Interoperability Requirements/Status (continued)

DSN Trunk Interfaces							
Interface	Critical	Interface Status	GSCR Requirement Required or Conditional		Reference	Test Results	Remarks
E1 CAS	No (Europe only)	Certified	Trunking	Framing (R)	GSCR Sect. 7	Met	
				Line Code (R)	GSCR Sect. 7	Met	
				Signaling (R)	GSCR Sect. 5	Met	
				Alarms (R)	GSCR Sect. 2.5.7, 7.1.4 & 7.2.2	Met	
				WWNDP (R)	GSCR Sect. 4.5.1	Met	
				Outpulsing digit formats (C)	GSCR Sect. 4.5.2	Met	
				Routing (C)	GSCR Sect. 4.2	Met	
				Trunk Groups(C)	GSCR Sect. 2.5.5 & 2.5.6	Met	
				Call Processing (R)	GSCR Sect. 4	Met	
				CAS to CCS trunk interworking (C)	GSCR Sect. 3.10	Met	
				PCM-24/PCM-30 Interoperation(C)	GSCR Sect. 7.3	Met	
			Direct Inward Dialing (C)	GSCR Sect. 2.3.2	Met		
			Voice	MOS (R)	CJCSI 6215.01B	Met	
				MLPP (R)	GSCR Sect. 3	Met	
				Secure calls (R)	CJCSI 6215.01B	Met	
			Facsimile	Analog: TIA/EIA-465-A (R)	DISR	Met	
			Data	Modem (VBD) (R)	CJCSI 6215.01B	Met	
				56-kbps switched data (R: ISDN PRI only)	GSCR Sect. 3.10	Met	
				64-kbps switched data (R: ISDN PRI only)	GSCR Sect. 3.10	Met	
				NX56 synchronous BER (R: ISDN PRI only)	GSCR Sect. 3.10	Met	
				NX64 synchronous BER (R: ISDN PRI only)	GSCR Sect. 3.10	Met	
Secure data (STE/STU-III) (R)	GSCR Sect. 3.10	Met					
VTC	ITU-T H.320 (C: ISDN PRI only)	DISR	Met				

Table 2-4. SUT Interoperability Requirements/Status (continued)

DSN Trunk Interfaces							
Interface	Critical	Interface Status	GSCR Requirement Required or Conditional		Reference	Test Results	Remarks
T1 ISDN PRI (ANSI T1.619a)	Yes	Certified	Trunking	Framing (R)	GSCR Sect. 7	Met	
				Line Code (R)	GSCR Sect. 7	Met	
				Signaling (R)	GSCR Sect. 5	Met	
				Alarms (R)	GSCR Sect. 2.5.7, 7.1.4 & 7.2.2	Met	
				Timing (R)	GSCR Sect. 11.1.1.2	Met	
				WWNDP (R)	GSCR Sect. 4.5.1	Met	
				Outpulsing digit formats (C)	GSCR Sect. 4.5.2	Met	
				Routing (C)	GSCR Sect. 4.2	Met	
				Trunk Groups(C)	GSCR Sect. 2.5.5 & 2.5.6	Met	
				Call Processing (R)	GSCR Sect. 4	Met	
				CAS to CCS trunk interworking (C)	GSCR Sect. 3.10	Met	
				PCM-24/PCM-30 Interoperation(C)	GSCR Sect. 7.3	Met	
			Direct Inward Dialing (C)	GSCR Sect. 2.3.2	Met		
			Voice	MOS (R)	CJCSI 6215.01B	Met	
				MLPP (R)	GSCR Sect. 3	Met	
				Secure calls (R)	CJCSI 6215.01B	Met	
			Facsimile	Analog: TIA/EIA-465-A (R)	DISR	Met	
			Data	Modem (VBD) (R)	CJCSI 6215.01B	Met	
				56-kbps switched data (R: ISDN PRI only)	GSCR Sect. 3.10	Met	
				64-kbps switched data (R: ISDN PRI only)	GSCR Sect. 3.10	Met	
				NX56 synchronous BER (R: ISDN PRI only)	GSCR Sect. 3.10	Met	
NX64 synchronous BER (R: ISDN PRI only)	GSCR Sect. 3.10	Met					
Secure data (STE/STU-III) (R)	GSCR Sect. 3.10	Met					
VTC	ITU-T H.320 (R: ISDN PRI only)	DISR	Met				

Table 2-4. SUT Interoperability Requirements/Status (continued)

DSN Trunk Interfaces							
Interface	Critical	Interface Status	GSCR Requirement Required or Conditional		Reference	Test Results	Remarks
E1 ISDN PRI (ITU-T Q.955.3)	No (Europe only)	Certified	Trunking	Framing (R)	GSCR Sect. 7	Met	
				Line Code (R)	GSCR Sect. 7	Met	
				Signaling (R)	GSCR Sect. 5	Met	
				Alarms (R)	GSCR Sect. 2.5.7, 7.1.4 & 7.2.2	Met	
				Timing (R)	GSCR Sect. 11.1.1.2	Met	
				WWNDP (R)	GSCR Sect. 4.5.1	Met	
				Outpulsing digit formats (C)	GSCR Sect. 4.5.2	Met	
				Routing (C)	GSCR Sect. 4.2	Met	
				Trunk Groups(C)	GSCR Sect. 2.5.5 & 2.5.6	Met	
				Call Processing (R)	GSCR Sect. 4	Met	
				CAS to CCS trunk interworking (C)	GSCR Sect. 3.10	Met	
				PCM-24/PCM-30 Interoperation(C)	GSCR Sect. 7.3	Met	
			Direct Inward Dialing (C)	GSCR Sect. 2.3.2	Met		
			Voice	MOS (R)	CJCSI 6215.01B	Met	
				MLPP (R)	GSCR Sect. 3	Met	
				Secure calls (R)	CJCSI 6215.01B	Met	
			Facsimile	Analog: TIA/EIA-465-A (R)	DISR	Met	
			Data	Modem (VBD) (R)	CJCSI 6215.01B	Met	
				56-kbps switched data (R: ISDN PRI only)	GSCR Sect. 3.10	Met	
				64-kbps switched data (R: ISDN PRI only)	GSCR Sect. 3.10	Met	
				NX56 synchronous BER (R: ISDN PRI only)	GSCR Sect. 3.10	Met	
NX64 synchronous BER (R: ISDN PRI only)	GSCR Sect. 3.10	Met					
VTC	Secure data (STE/STU-III) (R)	GSCR Sect. 3.10	Met				
	ITU-T H.320 (R: ISDN PRI only)	DISR	Met				

Table 2-4. SUT Interoperability Requirements/Status (continued)

DSN Line Interfaces							
Interface	Critical	Interface Status	GSCR Requirement Required or Conditional		Reference	Test Results	Remarks
2-Wire Analog (GR-506-CORE)	Yes	Certified	Access	DN Identification (R)	GSCR Sect 2.1.1	Met	
				Line signaling (R)	GSCR Sect 5.2	Met	
				Alerting Signals and Tones (R)	GSCR Sect 5.5	Met	
				WWNDP (R)	GSCR Sect. 4.5	Met	
				Call Treatments (R)	GSCR Sect. 4.1	Met	
				2W user access (R)	GSCR Sect 4.3.3	Met	
			Voice	Analog busy/idle (R)	GSCR Sect 4.3.4.1	Met	
				MOS (R)	CJCSI 6215.01B	Met	
				MLPP (R)	GSCR Sect. 3.4.3, 3.9	Met	
			Facsimile	Secure calls (R)	CJCSI 6215.01B	Met	
				Analog: TIA/EIA-465-A (R)	DISR	Met	
			Data	Modem (VBD) (R)	CJCSI 6215.01B	Met	
Secure data (STE/STU-III) (R)	GSCR Sect. 3.10	Met					
ISDN BRI NI 1/2 (S/T only) ²	No	Certified	Access	DN Identification (R)	GSCR Sect 2.1.1	Met	
				Line signaling (R)	GSCR Sect 5.2	Met	
				Alerting Signals and Tones (R)	GSCR Sect 5.5	Met	
				WWNDP (R)	GSCR Sect. 4.5	Met	
				Call Treatments (R)	GSCR Sect. 4.1	Met	
			Voice	MOS (R)	CJCSI 6215.01B	Met	
				MLPP (R)	GSCR Sect. 3.4.3, 3.9	Met	
				Secure calls (R)	CJCSI 6215.01B	Met	
			Data	Modem (VBD) (R)	CJCSI 6215.01B	Met	
				56-kbps switched data (R))	GSCR Sect. 3.10	Met	
				64-kbps switched data (R)	GSCR Sect. 3.10	Met	
				NX56 synchronous BER (R)	GSCR Sect. 3.10	Met	
				NX64 synchronous BER (R)	GSCR Sect. 3.10	Met	
				Secure data (STE/STU-III) (R)	GSCR Sect. 3.10	Met	
			VTC	ITU-T H.320 (R: ISDN BRI only)	DISR	Met	

Table 2-4. SUT Interoperability Requirements/Status (continued)

DSN Features & Capabilities						
Feature/ Capability	Critical	Status	GSCR Requirement Required or Conditional	Reference	Test Results	Remarks
Common Features	No	Certified	Selective call rejection (C)	GSCR Sect. 2.1.2	Not Supported	Minor ³
			Denied originating service (C)	GSCR Sect. 2.1.3	Not Supported	Minor ³
			Code restriction and diversion (C)	GSCR Sect. 2.1.4	Met	
			Three-way calling (C)	GSCR Sect. 2.1.5	Met	
			Add-on transfer and conference calling and call hold (C)	GSCR Sect. 2.1.6	Not Supported	Minor ³
			Call forwarding (C)	GSCR Sect. 2.1.7	Met	
			Call pick-up (C)	GSCR Sect. 2.1.8	Met	
Attendant	No	Certified	Call waiting (C)	GSCR Sect. 2.1.9	Met	
			Initiate all precedence levels (C)	GSCR Sect. 2.2.1	Met	
			Visual display (C)	GSCR Sect. 2.2.2	Met	
			Override class of service (C)	GSCR Sect. 2.2.3	Met	
			Override busy line (C)	GSCR Sect. 2.2.4	Met	
			Call deflection (C)	GSCR Sect. 2.2.5	Met	
			Auto recall (C)	GSCR Sect. 2.2.6	Not Supported	Minor ³
Public Safety	No	Certified	Waiting queue (C)	GSCR Sect. 2.2.7	Met	
			911 (C)	GSCR Sect. 2.4.1	Met	
			Trace of terminating calls (C)	GSCR Sect. 2.4.2	Met	
			Outgoing call trace (C)	GSCR Sect. 2.4.3	Met	
			Tandem call trace (C)	GSCR Sect. 2.4.4	Not Supported	Minor ³
Preset Conferencing	No	Not Supported	Trace of a call in progress (C)	GSCR Sect. 2.4.5	Not Supported	Minor ³
			Support 10 bridges; 1 originator and 20 conferees per bridge (C)	GSCR Sect. 2.6	Not Supported	Minor ³
			Assign up to 20 address numbers per bridge (C)	GSCR Sect. 2.6	Not Supported	Minor ³
			Use KXX codes for bridge access (C)	GSCR Sect. 2.6	Not Supported	Minor ³
			Conference notification recorded announcement (C)	GSCR Sect. 2.6.1	Not Supported	Minor ³
			Auto retrieval and alternate address (C)	GSCR Sect. 2.6.2	Not Supported	Minor ³
			Bridge release (C)	GSCR Sect. 2.6.3	Not Supported	Minor ³
			Lost connection (C)	GSCR Sect. 2.6.4	Not Supported	Minor ³
Nailed-Up Connections	No	Not Supported	Secondary conferencing (C)	GSCR Sect. 2.6.5	Not Supported	Minor ³
			Address translation (C)	GSCR Sect. 2.7	Not Supported	Minor ³
			Between any two like terminations (C)	GSCR Sect. 2.8	Not Supported	Minor ³
			PCM-24 and PCM-30, both CAS and CCS (C)	GSCR Sect. 2.8	Not Supported	Minor ³
			Supervision passed end-to-end for A/D or D/A (C)	GSCR Sect. 2.8	Not Supported	Minor ³
			Monitored and auto reconfigure (C)	GSCR Sect. 2.8	Not Supported	Minor ³
Support at least 10% of circuits as nailed-up (C)	GSCR Sect. 2.8	Not Supported	Minor ³			
Non-preemptable (C)	GSCR Sect. 2.8	Not Supported	Minor ³			

Table 2-4. SUT Interoperability Requirements/Status (continued)

DSN Features & Capabilities (continued)						
Feature/ Capability	Critical	Status	GSCR Requirement Required or Conditional	Reference	Test Results	Remarks
PAT	No	Not Supported	Classmark for/not for PAT screening (C)	GSCR Sect. 2.11.1	Not Supported	Minor ³
			7 PAT mechanisms (C)	GSCR Sect. 2.11.1	Not Supported	Minor ³
			Outgoing call screening (C)	GSCR Sect. 2.11.1.1	Not Supported	Minor ³
			Functional structure (C)	GSCR Sect. 2.11.1.2	Not Supported	Minor ³
			Overflow Process (C)	GSCR Sect. 2.11.1.3	Not Supported	Minor ³
			Simultaneous calls limitation (C)	GSCR Sect. 2.11.1.4	Not Supported	Minor ³
			Decrementing call-in-progress count (C)	GSCR Sect. 2.11.1.5	Not Supported	Minor ³
			Call treatment (C)	GSCR Sect. 2.11.1.6	Not Supported	Minor ³
			Queuing (C)	GSCR Sect. 2.11.1.7	Not Supported	Minor ³
			Attendant calls (C)	GSCR Sect. 2.11.1.8	Not Supported	Minor ³
			Operations measurement registers (C)	GSCR Sect. 2.11.1.9	Not Supported	Minor ³
Maintenance and Administration of thresholds (C)	GSCR Sect. 2.11.1.10	Not Supported	Minor ³			
DSN Hotline Services	No	Certified	Hotline restrictions (C)	GSCR Sect. 2.12	Met	
			Auto initiate (C)	GSCR Sect. 2.12	Met	
			Analog and digital (C)	GSCR Sect. 2.12	Met	
			Subscription basis (C)	GSCR Sect. 2.12	Met	
			Protected hotline calling (C)	GSCR Sect. 2.12.1-4	Met	
WWNDP interoperable (C)	GSCR Sect. 2.12.5	Met				
Network Management	No	Certified	Interfaces (C)	GSCR Sect. 9.1	Met	
			Measurements and data generation (C)	GSCR Sect. 9.2	Met	
			Fault management (C)	GSCR Sect. 9.3	Met	
			Configuration management (C)	GSCR Sect. 9.4	Met	
			Accounting management (C)	GSCR Sect. 9.5	Met	
			Performance management (C)	GSCR Sect. 9.6	Met	
			NM controls (C)	GSCR Sect. 9.7	Met	
Remote access (C)	GSCR Sect. 9.8	Met				
ISDN Services	No	Not Supported	EKTS (C)	GSCR Sect. 10, table 10-3	Not Supported	Minor ³
Synchronization	Yes	Certified	Line timing mode (R)	GSCR Sect. 11.1.1.2	Met	
			Internal Stratum 4 (R)	GSCR Sect. 11.1.2.2	Met	
Reliability	Yes	Certified	GR-512-CORE (R)	GSCR Sect. 12	Met	
Security	Yes	See note 4.	DITSCAP (R)	GSCR Sect. 13	See note 4.	
VoIP System	No	N/A	ITU-T G.711 PCM Codec (R)	GSCR App. 3	Not Tested	Minor ⁵
			Security in accordance with DITSCAP (R)	GSCR App. 3	Not Tested	Minor ⁵
			NM (R)	GSCR App. 3	Not Tested	Minor ⁵
			Latency @ 60 ms or less (R)	GSCR App. 3	Not Tested	Minor ⁵
			IPv6 capable (R)	GSCR App. 3	Not Tested	Minor ⁵

Table 2-4. SUT Interoperability Requirements/Status (continued)

DSN Features & Capabilities (continued)								
Feature/ Capability	Critical	Status	GSCR Requirement Required or Conditional		Reference	Test Results	Remarks	
LANs	No	N/A	LAN parameters (R)		GSCR App. 3	Not Tested	Minor ⁵	
			CoS/QoS (R)		GSCR App. 3	Not Tested	Minor ⁵	
			VLANs (R)		GSCR App. 3	Not Tested	Minor ⁵	
			IEEE Standards Conformance (R)		GSCR App. 3	Not Tested	Minor ⁵	
			.99999 availability (R)		GSCR App. 3	Not Tested	Minor ⁵	
			Modular devices (R)		GSCR App. 3	Not Tested	Minor ⁵	
			2 second link restoral (R)		GSCR App. 3	Not Tested	Minor ⁵	
			LAN NM (R)		GSCR App. 3	Not Tested	Minor ⁵	
Traffic Engineering (R)		GSCR App. 3	Not Tested	Minor ⁵				
Network Gateway								
Gateway	Critical	Interface Status	GSCR Requirement Required or Conditional		Reference	Test Results	Remarks	
PSTN	Yes	Certified	Trunking	Positive Identification Control (R)		CJCSI 6215.01B	Met	
				On-Netting (R)		CJCSI 6215.01B	Met	
				Off-Netting (R)		CJCSI 6215.01B	Met	
DRSN ⁶	Yes	Certified	Access	Alerting Signals and Tones (R)		GSCR Sect. 5.5	Met	
				Call Processing (R)		GSCR Sect. 4.4	Met	
				Call Treatments (R)		GSCR Sect. 4.1	Met	
				Analog busy/idle (R)		GSCR Sect. 4.3.4.1	Met	
			Voice	MOS (C)		CJCSI 6215.01B	Met	
				MLPP (C)		GSCR Sect. 3	Met	
				Secure Calls (C)		CJCSI 6215.01B	Met	
Alerting Signals and Tones (R)		GSCR Sect. 5.5	Met					

Table 2-4. SUT Interoperability Requirements/Status (continued)

LEGEND:					
2W	- 2-Wire	G.711	- PCM of voice frequencies	PCM-24	- Pulse Code Modulation - 24 Channels
911	- 911 Emergency Service	GR	- Generic Requirement	PCM-30	- Pulse Code Modulation - 30 Channels
A/D	- Analog to Digital Conversion	GSCR	- Generic Switching Center Requirements	PM	- Program Manager
ANSI	- American National Standards Institute	H.320	- Standard for narrowband VTC	PRI	- Primary Rate Interface
App.	- Appendix	IEEE	- Institute of Electrical and Electronics Engineers, Inc.	PSTN	- Public Switched Telephone Network
BER	- Bit Error Ratio	IPv6	- Internet Protocol version 6	Q.955.3	- ISDN Signaling Standard for E1 MLPP
BRI	- Basic Rate Interface	ISDN	- Integrated Services Digital Network	QoS	- Quality of Service
C	- Conditional	ITU	- International Telecommunication Union	R	- Required
CAS	- Channel Associated Signaling	ITU-T	- ITU -Telecommunication Standardization Sector	S/T	- ISDN BRI 4-wire interface
CCS	- Common Channel Signaling	kbps	- kilobits per second	Sect.	- Section
CJCSI	- Chairman of the Joint Chiefs of Staff Instruction	KXX	- K= any number 2-8; X= any number 1-9	SS7	- Signaling System 7
CoS	- Class of Service	LAN	- Local Area Network	STE	- Secure Terminal Equipment
D/A	- Digital to Analog Conversion	Mbps	- Megabits per second	STU-III	- Secure Telephone Unit-3 rd generation
DISA	- Defense Information Systems Agency	MLPP	- Multi-Level Precedence and Preemption	SUT	- System Under Test
DISR	- Department of Defense Information Technology Standards Registry	MOS	- Mean Opinion Score	T1	- Digital Transmission Link Level 1 (1.544 Mbps)
DITSCAP	- Department of Defense Information Technology Security and Accreditation Process	ms	- milliseconds	T1.619a	- SS7 and ISDN MLPP Signaling Standard For T1
DN	- Directory Number	NI 1/2	- National ISDN Standard 1 or 2	TIA	- Telecommunications Industry Association
DRSN	- Defense Red Switch Network	NM	- Network Management	TIA/EIA-465-A	- Group 3 Facsimile Apparatus for Document Transmission
DSN	- Defense Switched Network	NX56	- Data format restricted to multiples of 56 kbps	VBD	- Variable bit data
E1	- European Basic Multiplex Rate (2.048 Mbps)	NX64	- Data format restricted to multiples of 64 kbps	VLAN	- Virtual LAN
EIA	- Electronic Industries Alliance	PAT	- Precedence Access Threshold	VoIP	- Voice over Internet Protocol
EKTS	- Electronic Key Telephone System	PBX 1	- Private Branch Exchange 1	VTC	- Video Teleconferencing
		PCM	- Pulse Code Modulation	WWNDP	- Worldwide Numbering and Dialing Plan
NOTES:					
1	This feature or capability is not applicable to this interface.				
2	The SUT only supports an S/T 4-wire ISDN BRI interface. Since the ISDN BRI interface is a conditional requirement for a PBX 1 the operational impact is minor.				
3	This feature or capability not supported by the SUT. There is no operational impact because it is not a critical requirement for a PBX 1.				
4	DITSCAP information assurance testing is accomplished via DISA-led Information Assurance test teams and published in a separate report.				
5	This feature of capability is offered by the SUT however it was not tested and is not covered under this certification. Since this is a conditional requirement for a PBX 1, the risk of not testing is minor.				
6	Interoperability Certification of the SUT does not constitute DRSN PM approval for connectivity to the DRSN. It is the user's responsibility to request connectivity approval directly from the PM.				